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FRIDAY, OCTOBER 14, 1898.

CONTENTS:

<i>A New Gas</i> : CHARLES F. BRUSH.....	485
<i>The New York State College of Forestry</i> : PROFESSOR B. E. FERNOW	494
<i>Geology and Geography at the American Association Meeting (II.)</i> : WARREN UPHAM.....	501
<i>Notes on Inorganic Chemistry</i> : J. L. H.....	506
<i>Current Notes on Meteorology</i> :—	
<i>The Mean Annual Rainfall of the Globe; Symons' British Rainfall; Notes</i> : R. DEC. WARD.....	507
<i>Current Notes on Anthropology</i> :—	
<i>'On Inspiration'; Relics from the Uloa Valley</i> : PROFESSOR D. G. BRINTON	508
<i>Scientific Notes and News</i>	508
<i>University and Educational News</i>	512
<i>Discussion and Correspondence</i> :—	
<i>The Method of Types</i> : O. F. COOK. <i>The Supposed Bipolarity of Polar Fawns</i> : DR. ARNOLD E. ORTMANN.....	513
<i>Scientific Literature</i> :—	
<i>Hertwig on Die Zelle und die Gewebe</i> : PROFESSOR FRANK R. LILLIE. <i>Mills on Animal Intelligence</i> : DR. EDWARD L. THORNDIKE.....	517

MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

A NEW GAS.*

THE purpose of this purely preliminary paper is to announce the discovery of a new gas, presumably elementary, and possessed of some extraordinary properties. It is a constituent of the atmosphere and is occluded by many substances. Its chief

* Read before the American Association for the Advancement of Science, August 23, 1898.

characteristic thus far ascertained is enormous heat conductivity at low pressures. In order to appreciate this phenomenon it is necessary to consider the heat conductivity of some of the well-known gases.

A year ago I had the honor to read before this Section a paper on the transmission of heat by gases, illustrated by numerous curve sheets showing the heat conductivity of several gases at all pressures from atmospheric down to the best vacuum obtainable; also an allied paper on the measurement of small gaseous pressures. Abstracts of these papers appear in the current volume of Transactions, and their full text may be found in the *Philosophical Magazine* for January, 1898, and November, 1897, respectively.

The apparatus used for the described experiments in heat transmission consisted in part of a long-stemmed thermometer hanging in a long-necked glass bulb, the bulb of the thermometer being in the center of the glass bulb. Two bulbs were used for different experiments; the larger one 112 mm. in diameter, the smaller one only 20 mm. A tank of water and crushed ice under the bulb was adapted to be raised when desired, so as to immerse the bulb in the cold mixture. The neck of the bulb was connected with an air pump capable of reducing the internal pressure to a very small fraction of a millionth of atmospheric pressure; also with an elaborate pressure